Intimate Partner Violence and Cigarette Smoking: Association Between Smoking Risk and Psychological Abuse With and Without Co-Occurrence of Physical and Sexual Abuse

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Objectives. We examined the association between psychological abuse in a current relationship and current cigarette smoking among women, with and without the co-occurrence of physical or sexual abuse.

Methods. Women's experience of psychological abuse, experience of physical or sexual abuse, and smoking status were ascertained through a survey of female nurses. A score of 20 or more on the Women's Experience With Battering scale defined psychological abuse. We used logistic regression to predict current smoking, adjusting for demographic and social covariates. Analyses included women in a current relationship (n = 54 200).

Results. Adjusted analyses demonstrated that women experiencing only psychological abuse alone were 33% (95% confidence interval [CI] = 13%, 57%) more likely to smoke than nonabused women. Compared with nonabused women, psychologically abused women's risk of smoking was greater if they reported a single co-occurrence of physical or sexual abuse (odds ratio [OR] = 1.5; 95% CI = 1.3, 1.8) or multiple co-occurrences (OR = 1.9; 95% CI = 1.7, 2.3).

Conclusions. Psychological abuse in a current relationship was associated with an increased risk of smoking in this cohort of largely White, well-educated, and employed women. The co-occurrence of physical or sexual abuse enhanced that risk. Further research is needed to see if these associations hold for other groups. (*Am J Public Health.* 2008;98:527–535. doi:10.2105/AJPH.2003.037663)

Epidemiological research has increasingly informed our understanding of the nature and scope of intimate partner violence (IPV) against women, especially physical and sexual abuse.[1,2] An estimated 33% to 54% of American women are at risk for domestic violence during their lifetime, and 7% to 23% report current IPV to their primary health care providers.[3]

Following a recommendation from the National Research Council,[4] psychological abuse (also referred to as "emotional abuse") is considered distinct from other forms of IPV. It may occur independently or co-occur with these other forms of violence. Qualitative studies demonstrate that psychological abuse in an intimate relationship is an enduring, traumatic, and multidimensional experience. Conceptually distinct from episodic physical or sexual assault, psychological abuse involves isolation from social supports, humiliation or degradation, demonstration of power and threats, ongoing threat of physical danger, and a chronic sense of fear and disempowerment.[5,6] It can occur with or without concurrent physical or sexual abuse.[6–8]

There are many adverse physical and mental health consequences of violence against women.[6,9–12] Violence can affect health by increasing cigarette smoking,[13] a major preventable cause of morbidity and mortality among women. A relationship between IPV and smoking, hypothesized for some time,[14–17] is theoretically grounded in research on stress and coping. All forms of IPV can be conceptualized as a chronic psychological stressor.[18] Smoking is a means of reducing stress, especially among women.[19] Stress is associated with smokers' desire for a cigarette, smoking more cigarettes, and less success in quitting smoking.[20]

Population-based studies demonstrate an association between physical or sexual partner abuse and cigarette smoking,[5,21] but they have scarcely considered the influence of psychological abuse on smoking.[7]

We extend the present literature by examining the association between psychological abuse (measured with the Women's Experience With Battering [WEB] scale)—with and without the co-occurrence of physical or sexual abuse—and current cigarette smoking among women. This is an important public health issue for many reasons. Psychological abuse has been associated with an elevated risk for physical and mental health sequelae on a scale similar to or higher than that observed for physical or sexual violence.[22] Exposure to multiple forms of victimization may further increase the risk of adverse health outcomes or negative health behaviors.[23–26] The extent to which psychological abuse alone or in combination with physical or sexual abuse is associated with smoking has not been examined.

We sought to describe the prevalence of physical or sexual abuse and psychological abuse, and their co-occurrence, and tested the following hypotheses among women in a current relationship: (1) women experiencing psychological abuse alone will be more likely to smoke cigarettes, and (2) women experiencing multiple types of abuse (i.e., the co-occurrence of psychological abuse and physical or sexual abuse) will be at an even higher risk of smoking than nonabused women.

METHODS

Study Sample

These analyses were conducted within the Nurses' Health Study II,[27] an ongoing prospective study of nurses established in 1989. A total of 116 662 female registered nurses aged 25 to 44 years at the initiation of the study completed a mailed questionnaire on their medical history and lifestyle. Follow-up questionnaires were mailed every 2 years to update information on the occurrence of diseases and ongoing health behaviors.

A supplementary questionnaire designed to examine exposure to violence across the life cycle was mailed in 2001 to 91 248 study participants (excluding those who had previously requested short-form questionnaires only or who required more than 4 mailings before responding to the main follow-up questionnaire in 1999). Nonrespondents received a reminder postcard to return the supplemental questionnaire. We received 68 505 questionnaires (75.1% response rate).

Given our focus on the associations between current IPV and current smoking status, these analyses were restricted to women who reported being in a current relationship. After the exclusion of women who were missing information on whether the relationship was past or current (n=3215), who indicated their response was based on a past relationship (n=7693), or who did not have complete data on the outcome, predictor, or covariates used in the analysis (n=3397), the final sample size was 54 200.

Measures

Assessment of physical and sexual abuse. We ascertained physical and sexual abuse using items from the Abuse Assessment Screen (Appendix I; available as a supplement to the online version of this article at http://www.ajph.org).[28,29] The physical abuse item measured whether the respondent had ever been physically hurt by a spouse or significant other. The sexual abuse item measured whether a spouse or significant other had ever forced her to engage in sexual activity. Abuse was categorized as (1) never experienced any abuse, (2) experienced physical or sexual abuse once, or (3) experienced physical or sexual abuse more than once.

Assessment of psychological abuse. We assessed psychological abuse using 2 measures: a single-item perceived emotional abuse question from the Abuse Assessment Screen (Appendix I) and the 10-item WEB scale developed by Smith et al.[5] (WEB uses the term "psychological battering" instead of "psychological abuse.") The WEB scale, which is theoretically grounded in victimology research, operationalizes a woman's ongoing psychological vulnerability through qualitative research focusing on women who survived relationships involving domestic violence.[30,31] Psychological abuse, as measured by the WEB scale, has been defined as "a process whereby one member of an intimate relationship experiences vulnerability, loss of power and control, and entrapment as a consequence of the other member's exercise of power through the patterned use of physical, sexual, psychological, and/or moral force."[8]

Previous studies have demonstrated that the WEB scale can distinguish abused from nonabused women and has strong internal consistency (Cronbach $\alpha=0.99$).[30,31] In our sample, the Cronbach α was 0.92. Each item was scored on a 6-point Likert scale with a total summary score ranging from 10 to 60. To define those experiencing psychological abuse, we used the WEB scale's recommended cutpoint of 20 or higher.[7,8] In addition, taking advantage of the multi-item WEB scale, we created a continuous variable to determine whether there was a dose–response group association between the WEB score and likelihood of smoking.

Composite Intimate Partner Violence Scale

Examining psychological abuse, in addition to physical and sexual abuse, may provide a more complete picture of abuse than would be provided if each type were considered independently.[7] Each type of abuse taps into a different domain, as previously recognized in the literature on violence. Agudelo[32] conceptualized IPV as an "exercise of power" expressed through different kinds of aggression or force that may include, but are not limited to, physical or sexual assault. Pence and Paymar[33] extended this notion by recognizing that domestic abuse toward women consists of a variety of tactics, including physically assaulting them; threatening, intimidating, and humiliating them; isolating them and restricting their access to resources; threatening the safety of their children and others in their families; and controlling their activities outside the home.

For these analyses, we constructed 7 categories of IPV on the basis of items from the Abuse Assessment Screen and scores on the WEB scale: (1) no reported physical, sexual, or perceived emotional abuse or psychological abuse (WEB score<20); (2) report of perceived emotional abuse only; (3) psychological abuse only; (4) no psychological abuse, but 1 report of physical or sexual abuse; (5) psychological abuse with 1 report of physical or sexual abuse; (6) no psychological abuse, but more than 1 report of physical or sexual abuse; and (7) psychological abuse with more than 1 report of physical or sexual abuse. Compared with the 10-item WEB psychological abuse scale, the single-item perceived emotional abuse question from the Abuse Assessment Screen is less able to reflect the complex features of psychological abuse. We therefore considered perceived emotional abuse as a separate category only if a woman reported no physical or sexual abuse and no psychological abuse.

Current Smoking Status

Self-reported smoking status was ascertained through the baseline and biennial questionnaires. In the baseline survey, women were asked whether they had smoked 20 packs of cigarettes in their lifetime. Subsequently, they were asked every 2 years whether they currently smoked cigarettes. We defined current smokers as those smoking in 2001.

Other Covariates

Data were collected on demographic covariates, including age; race/ethnicity; relevant childhood experiences, including parental smoking, smoking status by age 19, and preadult exposure to violence; and other social factors shown in previous research to be associated with IPV and smoking. The latter included social networks,[34] annual household income,[16] and mental health[19] (see Table 1 for categorization).

Physical and sexual abuse during childhood was assessed through 5 questions on physical abuse adapted from the Revised Conflict Tactics Scale[35] and 2 questions on sexual abuse modified from a national telephone survey.[36,37] Respondents were considered to have experienced preadult abuse if they reported either physical or sexual abuse during childhood. Smoking status by age 19 was ascertained through the baseline questionnaire.

Social networks were measured with the Berkman–Syme Social Network Index,[38] which measures marital status; number of close friends, relatives, and children and frequency of contact with these people; religious

TABLE 1—Sample Characteristics, by Prevalence of Psychological Abuse and Smoking: The Nurses' Health Study II, 2001

	Total Sample, no. (%)	WEB ≥ 20,[a] %	P[b]	Currently Smoking, %	P[c]
Total	54 200 (100.0)	9.8		7.8	
Composite adult abuse scale					<.001
No abuse	31 156 (57.5)			5.7	
Perceived emotional abuse only[d]	7 079 (13.1)			9.2	
Psychological abuse only	2 343 (4.3)			8.6	
No psychological abuse, but 1 report of physical or sexual abuse	6 157 (11.4)			10.1	
Psychological abuse, with 1 report of physical or sexual abuse	1 235 (2.3)			10.8	
No psychological abuse, but >1 report of physical or sexual abuse	4 526 (8.4)			13.1	
Psychological abuse, with >1 report of physical or sexual abuse	1 704 (3.1)			14.3	
Age, y			.003		<.001
37–41	9 320 (17.2)	8.9		6.6	
42–46	17 295 (31.9)	10.0		7.6	
47–51	17 873 (33.0)	10.1		8.3	
52–56	9 712 (17.9)	9.4		8.2	
Race/ethnicity			.159		<.001
White	51 507 (95.0)	9.7		7.8	
Black	501 (0.9)	11.2		8.0	
Hispanic	639 (1.2)	10.8		4.5	
Asian	692 (1.3)	9.4		5.1	
Other	861 (1.6)	11.9		10.7	
Parents' smoking during respondent's childhood (age birth–11 y)			.590		<.001
Neither smoked	19 383 (35.8)	9.6		5.0	
Mother smoked	4 295 (7.9)	9.4		9.2	
Father smoked	15 394 (28.4)	9.8		8.3	
Both parents smoked	15 128 (27.9)	10.0		10.4	
Combined physical and sexual abuse during preadulthood (age birth–17 y)			<.001		<.001
No abuse	18 903 (34.9)	6.5		6.1	
Abuse	35 297 (65.1)	11.5		8.7	
Social Network Index[e]			<.001		<.001
High	28 814 (53.2)	8.1		5.5	
Mid-high	9 059 (16.7)	9.8		8.8	
Mid-low	10 210 (18.8)	13.3		11.1	
Low	2 123 (3.9)	14.5		17.0	
Missing	3 994 (7.4)	10.1		8.3	
Household income, $			<.001		<.001
>100 000	17 282 (31.9)	8.7		6.3	
75 000–99 999	10 187 (18.8)	9.7		7.9	
50 000–74 999	11 416 (21.1)	10.5		9.4	
<50 000	5 438 (10.0)	13.6		10.9	
Missing	9 877 (18.2)	8.7		6.7	

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service attendance; and participation in social groups. Comorbid psychological symptomatology was ascertained with the 5-item Mental Health Inventory (MHI–5) from the Medical Outcomes Study 36-Item Short Form Health Survey.[39] The MHI–5 score ranges from 0 to 100, with higher scores reflecting better mental health. The MHI–5 score was dichotomized at a cutpoint of 52 as previously established,[40] with those scoring 52 or below being more likely to satisfy clinical diagnostic criteria for depression and related disorders.

Statistical Analysis

We first calculated the prevalence of smoking and psychological abuse across categories of adult abuse and other covariates. We next estimated the odds of current smoking among women experiencing various forms of IPV compared with women reporting no abuse in a current adult relationship. To calculate odds ratios and 95% confidence intervals, we conducted logistic regression analyses using SAS version 8.2 (SAS Institute Inc, Cary, NC). Model 1 was adjusted for standard demographic variables. In model 2, we controlled for earlier life exposures that could be potential confounders: parental smoking, exposure to physical or sexual violence during childhood, and smoking status by the age of 19.

Finally, in model 3 we further controlled for potential confounding covariates occurring in adulthood: social networks, psychological comorbidity (MHI–5), and annual household income. To decide which covariates to include in the final model, we examined the extent to which each variable attenuated the relationship between current IPV and current smoking risk and conducted the log likelihood ratio test to determine whether including those variables improved the model fit.

Because (1) most smokers initiate smoking in adolescence or early adulthood,[41] (2) abuse in early life is associated with smoking initiation,[42,43] and (3) abuse in early life is correlated with abuse in adult relationships,[44] the association between abuse in adulthood and current smoking status may be confounded by an earlier history of abuse. To further address this issue, we examined the association between IPV in a current adult relationship and current smoking in a subsample of women who reported no abuse prior to adulthood.

TABLE 1—*Continued*

Mental Health Index[f]			<.001	<.001
MHI-5 score > 52	47 312 (87.3)	8.1	7.2	
MHI-5 score ≤ 52	4896 (9.0)	24.9	12.2	
Missing	1992 (3.7)	12.4	10.8	

Note. All data are taken from the 2001 survey, except race/ethnicity (from 1989 baseline survey) and parents' smoking during respondent's childhood (from 1999 questionnaire).
[a]A score of 20 on the Women's Experience With Battering (WEB) scale was the cutpoint for psychological abuse.
[b]Women with WEB scores of less than 20 served as the reference group.
[c]Nonsmoking women served as the reference group.
[d]Perceived emotional abuse was defined as answering yes to "have you ever been emotionally abused by your spouse or significant other?"
[e]See Berkman and Syme.[38]
[f]Ascertained with the 5-item Mental Health Inventory (MHI-5), from the Medical Outcomes Study 36-Item Short Form Health Survey.[39]

On average, women who participated in our study were similar to the overall cohort in terms of age (46.4 vs 46.2 years, respectively), mental health (MHI–5) score (75.5 vs 74.7), and baseline smoking status (11.3% vs 12.5% smoked in 1989), but had somewhat higher household incomes (62.0% vs 56.0% of those reporting income earned more than $75 000 per year). We used an inverse probability weighting scheme[45] to account for known attrition bias (weighted for age, race, household income, and mental health score). We obtained very similar results in the unweighted and weighted samples and therefore present the unweighted results. Because our study sample was recruited from those in the nursing profession in 1989, sample characteristics reflected the composition of nurses at that time. Our sample is predominantly White (95%), employed (87%), middle-aged (two thirds are aged between 42 and 51 years), well educated (all have nursing degrees), and with above-average annual income (with 62.0% making $75 000 or more).

RESULTS

Table 1 presents the distribution of the composite IPV scale and individual characteristics by psychological abuse and current smoking status. The overall smoking prevalence in 2001 was 7.8%, and the prevalence of psychological abuse in a current relationship (defined as having a WEB score ≥ 20) was 9.7%. Table 2 shows the prevalence of different types of IPV during adulthood.

Table 3 summarizes the logistic regression analyses. Results from model 1 present the independent effects of psychological abuse (based on the WEB score) and other forms of IPV on current smoking, adjusted for age and race/ethnicity. In model 2, parental smoking, preadult abuse, and smoking status by age 19 were added to the model. Women with 1 episode of physical or sexual abuse when the physical or sexual abuse occurred without psychological abuse were 1.5 times more likely to smoke (95% confidence interval [CI]=1.4, 1.7) than were women reporting no abuse and 1.8 times more likely (95% CI=1.7, 2.1) when physical or sexual abuse occurred with psychological abuse. Women with recurrent physical or sexual abuse (i.e., reporting more than 1 episode) were 1.9 times more likely (95% CI=1.7, 2.1) to smoke than nonabused women when physical or sexual abuse occurred alone and 2.4 times more likely (95% CI=2.0, 2.8) when recurrent physical or sexual abuse occurred with psychological abuse. In model 3, we further adjusted for income, social networks, and the women's mental health status. Although the effects of abuse on smoking were attenuated, significant associations between psychological abuse and smoking remained.

We then examined the relationship between WEB scale score (categorized as 10, 11–19, 20–29, 30–39, and 40–60) and current smoking status. As shown in Figure 1, the odds of current smoking among women in each of these WEB categories (after we adjusted for age and race/ethnicity) increased in a dose–response group fashion.

To avoid the possible confounding effect of preadult abuse with early smoking initiation, we examined the subsample of women with no reported history of preadult abuse (Table 4). The association between psychological abuse and smoking was even stronger in this subset. Compared with women reporting no adulthood abuse, women abused in adulthood but with no history of preadult abuse had the following odds of smoking: for women reporting psychological abuse on the WEB scale (WEB ≥ 20) without physical or sexual abuse, the odds ratio was 1.5 (95% CI=1.1, 2.0); for psychological abuse with 1 report of physical or sexual abuse, the odds ratio was 1.8 (95% CI=1.2, 2.7); for psychological abuse on the WEB scale with physical or sexual abuse reported more

TABLE 2—Prevalence of Different Types of Intimate Partner Violence Experienced by Women During Adulthood: The Nurses' Health Study II, 2001

Type of Abuse	Did Not Report Psychological Abuse, no. (%)	Reported Psychological Abuse, no. (%)	Total, no. (%)
No abuse	31 156 (100.0)		31 156 (57.5)
Perceived emotional abuse only[a]	7 079 (100.0)		7 079 (13.1)
Psychological abuse only		2 343 (100.0)	2 343 (4.3)
Physical or sexual abuse	10 683 (78.4)	2 939 (21.6)	13 622 (25.1)
1 report	6 157 (83.3)	1 235 (16.7)	7 392 (13.6)
>1 report	4 526 (72.6)	1 704 (27.4)	6 230 (11.5)
Total	48 918 (90.3)	5 282 (9.7)	54 200 (100.0)

Note. Psychological abuse was measured with the Women's Experience With Battering (WEB) scale, with a score of 10 to 19 indicating no abuse and 20 to 60 indicating abuse.
[d]Perceived emotional abuse was defined as answering yes to "have you ever been emotionally abused by your spouse or significant other?"

TABLE 3—Logistic Regression Analysis of Current Smoking in Women (n = 54 200), by Combinations of Different Types of Abuse in Adulthood: The Nurses' Health Study II, 2001

	Model 1, OR (95% CI)	Model 2, OR (95% CI)	Model 3, OR (95% CI)
Composite adult abuse scale			
No abuse	1.0	1.0	1.0
Perceived emotional abuse only	1.7 (1.5, 1.8)	1.5 (1.3, 1.6)	1.3 (1.2, 1.5)
Psychological abuse only	1.6 (1.3, 1.8)	1.5 (1.3, 1.8)	1.3 (1.1, 1.6)
No psychological abuse, but 1 report of physical/sexual abuse	1.9 (1.7, 2.1)	1.5 (1.4, 1.7)	1.4 (1.2, 1.5)
Psychological abuse, with 1 report of physical/sexual abuse	2.0 (1.7, 2.4)	1.8 (1.5, 2.2)	1.5 (1.2, 1.9)
No psychological abuse, but >1 report of physical/sexual abuse	2.5 (2.2, 2.7)	1.9 (1.7, 2.1)	1.6 (1.4, 1.8)
Psychological abuse, with >1 report of physical/sexual abuse	2.8 (2.4, 3.2)	2.4 (2.0, 2.8)	1.9 (1.6, 2.2)
Age	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)	1.0 (1.0, 1.0)
Race/ethnicity			
White	1.0	1.0	1.0
Black	0.8 (0.6, 1.2)	1.1 (0.8, 1.5)	1.1 (0.8, 1.5)
Hispanic	0.5 (0.4, 0.8)	0.6 (0.4, 0.9)	0.6 (0.4, 0.9)
Asian	0.6 (0.5, 0.9)	1.0 (0.7, 1.4)	0.9 (0.6, 1.3)
Other	1.4 (1.1, 1.8)	1.5 (1.2, 1.9)	1.5 (1.2, 1.9)
Parents' smoking during respondent's childhood (age birth–11 y)			
Neither smoked		1.0	1.0
Mother smoked		1.4 (1.2, 1.6)	1.4 (1.2, 1.5)
Father smoked		1.5 (1.3, 1.6)	1.4 (1.3, 1.6)
Both parents smoked		1.6 (1.5, 1.8)	1.6 (1.4, 1.7)
Combined physical and sexual abuse during preadulthood (age birth–17 y)			
No abuse		1.0	1.0
Abuse		1.0 (1.0, 1.1)	1.0 (1.0, 1.1)
Smoking by age 19 y			
No		1.0	1.0
Yes		7.2 (6.7, 7.7)	7.0 (6.6, 7.6)
Social Network Index[b]			
High			1.0
Mid-high			1.4 (1.3, 1.5)
Mid-low			1.6 (1.4, 1.7)
Low			2.1 (1.9, 2.4)
Missing			1.0 (0.8, 1.1)
Household income, $			
>100 000			1.0
75 000–100 000			1.3 (1.2, 1.4)
50 000–75 000			1.5 (1.4, 1.7)
<50 000			1.6 (1.5, 1.8)
Missing			1.1 (1.0, 1.2)
Mental Health Index[c]			
MHI-5 score > 52			1.0
MHI-5 score ≤ 52			1.3 (1.2, 1.5)
Missing			2.1 (1.7, 2.7)

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than once, the odds ratio was 2.5 (95% CI = 1.8, 3.6).

DISCUSSION

This is the first large-scale study to measure the association between psychological abuse (as measured by the WEB scale) and women's smoking behavior; in addition, it measures the association between physical and sexual abuse and women's smoking. These data show that the effect of psychological abuse on current smoking is independent of the effects of other forms of abuse; they also show that the risk of smoking increases with the co-occurrence of all types of violence. Although women experiencing either psychological abuse, or physical or sexual abuse alone had an increased risk of smoking, women who experienced psychological abuse concurrently with physical or sexual abuse had an even higher risk of smoking compared with women reporting no IPV. The risk was greatest for those reporting psychological abuse who also experienced more than 1 episode of physical or sexual abuse. Although earlier studies examining the association between IPV and smoking considered only discrete types of events (e.g., physical or sexual abuse),[15–17,46,47] our data show that the effects of psychological abuse and other forms of violence on smoking behavior are cumulative and act independently of one another. These relationships persisted after we controlled for potential confounders and stress buffers (i.e., social networks).

Prevalence of Abuse

The reported prevalence of physical or sexual abuse in this sample (25.1%) was similar to that reported by the 1996 National Violence Against Women Survey, in which 24.8% of women reported physical or sexual abuse.[48] In our cohort, more than half the women who reported psychological abuse also reported episodes of physical or sexual abuse (55.6%). This finding is consistent with a broadened concept of IPV, according to which psychologically abused women are in a state of continuous vulnerability and are sometimes physically abused.[31,49] Of women experiencing psychological abuse in our study, 44.4% reported no physical or sexual abuse. This finding

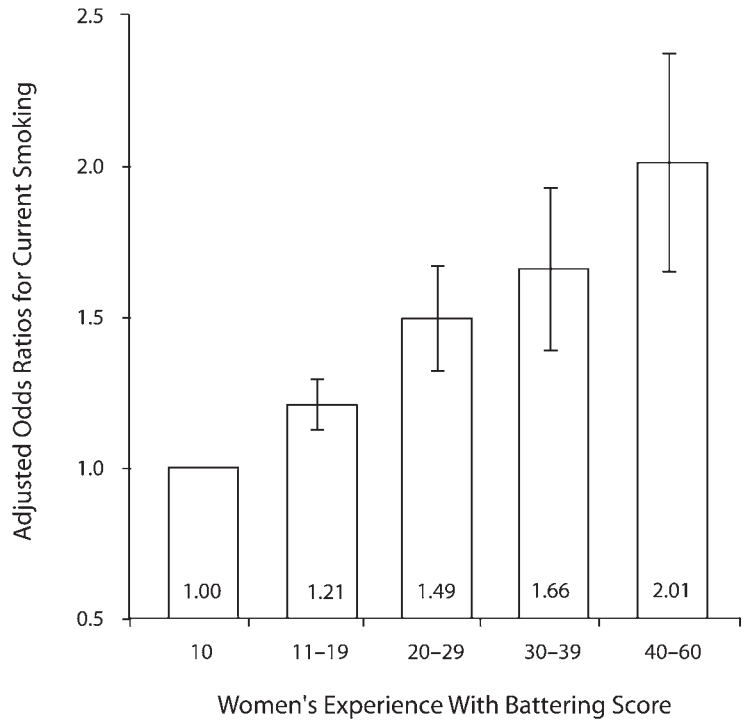
TABLE 3—*Continued*

Goodness-of-fit			
–2 log likelihood	29 047	25 325	24 915
Difference between previous –2 log likelihood and current –2 log likelihood[d]	47.0	3 722.0	410.0
Degrees of freedom	5.0	5.0	10.0
P	<.001	<.001	<.001
C statistics	0.6	0.8	0.8

Note. OR = odds ratio; CI = confidence interval. For explanation of models, see "Methods" section.
[a]A score of 20 on the Women's Experience With Battering (WEB) scale was the cutpoint for psychological abuse.
[b]See Berkman and Syme.[38]
[c]Ascertained with the 5-item Mental Health Inventory (MHI–5), from the Medical Outcomes Study 36-Item Short Form Health Survey.[39]
[d]–2 log likelihood of the unadjusted model is 29 093.

is also consistent with studies by Coker et al.[50] and Smith et al.,[7] who reported that of women experiencing psychological abuse, 42.5% and 42.9%, respectively, did not experience concurrent physical or sexual violence. There is therefore a need to screen separately for psychological abuse.

In our cohort, the prevalence of psychological abuse in a current relationship (9.7%) was slightly lower than that reported by Smith et al.[7] (13.1%) and Coker et al.[8] (12.8%). This may be because of the characteristics of our study sample. For example, Flitcraft[51] reported that the most vulnerable age for IPV is 18 to 24 years for sexual abuse and 24 to 32 for domestic violence, and the age range of our sample was 37 to 56. In the study by Smith et al.,[7] the women's ages ranged from 18 to 45, and in the study by Coker et al.[50] they ranged from 18 to 65. We also speculate that the higher socioeconomic position of our cohort based on educational achievement (all had nursing degrees) and employment status (86.6% were employed in 2001) may have further influenced our results; that is, having a job and steady income may help women avoid or escape from abusive partners.[52]



Note. A Women's Experience With Battering score of greater than 20 is the established cutpoint of absence and presence of psychological abuse.[7]

FIGURE 1—Odds ratios, adjusted for age and race/ethnicity, for current smoking among women (N = 54 2000), by Women's Experience With Battering scores: The Nurses' Health Study II, 2001

Women With No Experience of Abuse Before Adulthood

Jun et al. found that women who experienced abuse in childhood or adolescence were more likely to start smoking cigarettes—and to start smoking earlier—than women who were not abused early in life.[43] It would thus seem plausible that the relationship between abuse and smoking in this cohort was an extension of the association in childhood, because those with preadult abuse were also more likely to have IPV in adult relationships,[44,53–55] and early initiation of smoking may impede its cessation. This supposition is contradicted, however, by our finding that the association between IPV in a current relationship and current smoking was even stronger among women who did not report any abuse prior to adulthood. Moreover, although it is conceivable that prior smoking influences the likelihood of being in any type of abusive relationship, the fact that the relationship between IPV and pyschological abuse and current smoking was unchanged after we controlled for smoking status by age 19 indicates that a history of smoking is unlikely to explain the association between current abuse and current smoking.

Strengths and Limitations

This study has a number of particular strengths. Although it did not use a random sample of US women, it is more similar to a population-based cohort than the clinic-based samples and groups of abused women that

TABLE 4—Association Between Current Smoking and Abuse in Adulthood Among Women, With Analyses Restricted to Women With No History of Preadult Abuse: The Nurses' Health Study II, 2001

	Sample, no. (%)	Respondents' Odds of Smoking, OR[a] (95% CI)[a]
Total sample	18 907 (100.0)	
Abuse and psychological abuse during adulthood		
No abuse	13 055 (69.1)	1
Perceived emotional abuse only[b]	2 146 (11.4)	1.5 (1.2, 1.8)
Psychological abuse only	676 (3.6)	1.5 (1.1, 2.0)
No psychological abuse, but 1 report of physical or sexual abuse	1 591 (8.4)	1.6 (1.3, 1.9)
Psychological abuse, with 1 report of physical or sexual abuse	247 (1.3)	1.8 (1.2, 2.7)
No psychological abuse, but > 1 report of physical or sexual abuse	889 (4.7)	1.7 (1.4, 2.2)
Psychological abuse, with > 1 report of physical or sexual abuse	303 (1.6)	2.5 (1.8, 3.6)

Note. OR = odds ratio; CI = confidence interval. Model was adjusted for age, race, parental smoking, social networks, income, and mental health (5-item Mental Health Inventory [MHI–5]).
[a]Odds of smoking compared with those of women reporting no adulthood abuse.
[b]Women with WEB scores of less than 20 served as the reference group.

have been examined in this literature to date. It was a large sample with a high response rate (74.5%) for the assessment of violence and the outcome of interest. Multiple types of abuse were concurrently assessed, including physical, sexual, and psychological abuse. With these rich data, we were able to examine the independent effects of psychological abuse and determine whether concurrent exposure to different types of abuse increased risk of smoking. Using the multi-item WEB scale, we were also able to demonstrate a dose–response group relationship between reported psychological abuse and smoking status.

A number of limitations also warrant consideration. First, our study sample was relatively homogeneous, consisting of women who were primarily White, middle-aged, well educated, employed and in the higher income categories, and with smoking prevalences lower than those of women with similar educational levels.[56] Notably, our sample is in the age range (37–56 years) in which others have found a decrease in the prevalence of smoking.[56] Although the somewhat low prevalence of smoking may affect generalizability, it does not affect the internal validity of the study. Caution should be used in generalizing these findings to non-Whites, women with limited education, lower socioeconomic status groups, or younger women (aged < 37 years). Future studies based on populations with greater ethnic and demographic diversity would also be desirable.

The study relied on self-report of abuse. Although previous studies have demonstrated a tendency to underreport abuse,[57,58] the validity of self-report of violence has been demonstrated by (1) concordance with other indicators, (2) reliability or internal consistency of maltreatment responses within and across time, and (3) predictive validity.[59] In addition, the cross-sectional nature of the study limited our ability to establish with certainty a temporal association between psychological abuse in a current relationship, with and without other correlates of IPV, and current smoking status. However, we attempted to address 2 possible temporal ambiguities: (1) to exclude the possibility that some characteristics of smokers may make them more likely to experience IPV than nonsmokers, we controlled for prior smoking status and (2) to exclude the possibility that the relationship between current abuse and smoking reflected an increased risk of abuse in early life and consequent earlier initiation of smoking persisting into adulthood, we tested our hypothesis among those who did not report preadult abuse. The strong association between current IPV and current smoking from both of these restricted samples strengthens our inference. Also, the observed dose–response group relationship strengthens our confidence in the observed association.

Another limitation is that, for physical, sexual, and perceived emotional abuse reported on the Abuse Assessment Screen, we were unable to identify whether the reported abuse occurred during a current or past relationship (or both).

Conclusions

Psychological abuse on the WEB scale was associated with higher risk of smoking among this cohort of US nurses. Further research is needed to establish whether it holds in other groups. The risk of smoking is further magnified when other forms of physical or sexual violence occur with psychological abuse as determined by the WEB scale. Abused women live in a coercive and controlling environment. Changes in smoking behavior, whether self-initiated or supported by formal cessation programs, may be unlikely to be sustained if individuals return to an unchanged environment and its indigenous stressors. When designing and implementing smoking cessation interventions, efforts should be taken to find the factors that influence the initiation and maintenance of smoking. Our data suggest that stressors such as IPV may contribute to smoking. Inquiring about and responding to ongoing domestic abuse may benefit women's health not only by reducing the prevalence of exposure to violence but also through enhancing the effectiveness of interventions designed to reduce the prevalence of smoking. Because psychological abuse, as defined on the WEB scale, frequently occurs independently of physical or sexual abuse, screening efforts should include psychological abuse as another important dimension of the abuse of women. ■

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Contributors

H.-J. Jun originated the study, completed the analyses, and led the writing. J. W. Rich-Edwards helped design the study and interpret the findings. R. Boynton-Jarrett helped analyze data. R.J Wright collected the data and helped to conceptualize ideas, interpret findings, and revise the article.

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This study was approved by the institutional review boards at the Brigham and Women's Hospital and the Harvard School of Public Health.

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